THE PORT OF NEW YORK AUTHORITY

0011673

NOT FOR
PUBLIC RELEASE

THE WORLD TRADE CENTER

CONTRACT WTC-40.000

CURTAIN WALL TOWER BUILDINGS A & B

TECHNICAL SPECIFICATIONS

SEPTEMBER 1, 1966

PLAINTIFF'S EXHIBIT
PX-456

TECHNICAL SPECIFICATIONS

THE WORLD TRADE CENTER

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II. WORK EXCLUDED

A. The following Work shall not be furnished and installed by the Contractor:

1. Structural steel columns, spandrel plates, and floor trusses including steel noted as "By Steel Contractor" or "By Structural Contractor".

2. The interior metal heads (complete with the batt insulation and drapery track), and the fixed metal stools (complete with batt insulation and removable grilles), and the interior metal column enclosures.

   The Contractor shall make provision in his design so that these items of Work may be built into the curtain wall work by others in a manner approved by the Authority.

3. Sprayed-on fireproofing for trusses, metal deck, and interior (core) steel columns and beams.

4. Window washing unit, transfer rail (with pipe support) and equipment, other than providing the stainless steel track.

5. Concrete work, built-up roofing and gravel, and metal cap and base flashing.

6. The 2 inch rigid insulation and gypsum plank.

7. The gypsum board construction.

8. Standing seam sheet metal roofing, including wedges and sealant at joint where coping meets the sheet metal roofing.

9. Membrane waterproofing, metal flashing, and drains and metal expansion joints at the exterior column base.

10. Sealant only over the 1/2 inch expansion joint at the exterior column base.

b. The materials used for the glazing of the exterior face of glass shall be extruded and/or installed in such manner that the top surface exposed to the weather forms a sloped surface beyond the edge of the glazing stop to drain water away from the face of the glass.

c. The materials used for the glazing of the interior face of glass shall conform to the requirements specified hereinbefore for glazing of the exterior face of glass except that the materials shall include a dense neoprene rubber, or other approved non-absorptive hard finish material for the exposed sloped top surface.

Continuous neoprene rubber glazing finishing beads having a depth equal to the full glass bite and having a beveled top surface will be acceptable, subject to its ability to conform to all the other requirements of this Specification. Where continuous beads are provided, the stops shall interlock with the glazing stops in an approved manner.

d. The thickness of setting blocks, and the depth of interior and exterior glazing materials shall be such as to provide the following minimum glass bites, unless greater glass bites are required to meet the requirements of this Specification.

For Glass Thickness (inches)	Glass Bite (inches)
1/4	1/2
3/8	1/2
1/2	5/8
5/8	5/8
3/4	3/4
1	1

5. Insulation and fireproofing materials shall conform to the following requirements:

a. All materials shall be:

1) Non-combustible.

2) Non-toxic, including the gases and vapors released under heat and flame.

3) Rot-proof.

4) Vermin-proof.

5) Non-corrosive.

6) Non-soluble in water starting from the fourth hour after installation.

7) Chemically inert and physically stable under various temperature and moisture conditions starting from the fourth hour after installation.

8) Non-rigid and compressible to the extent that any pressure caused by the differential movement of structural steel and curtain wall shall not adversely affect the curtain wall construction and appearance.

b. Where insulated components (other than column covers) are required in Section I hereof entitled "Work Included", the insulation for all such Work shall be applied in such thickness to provide a maximum coefficient of heat transmission ("U" Factor) of 0.18 B.T.U./hour/square foot/degree Fahrenheit based on air to air conditions (air-metal-insulation-air).

c. Fireproofing for the spandrel beams shall be equal to materials approved by the Underwriters' Laboratories, Inc. for providing a 3-hour fire resistance rating on conventional steel beams.

d. Fireproofing for columns shall be equal to materials approved by the Underwriters' Laboratories, Inc. for providing a 4-hour fire resistance rating of material on conventional heavy type steel columns.

e. The insulation for insulated column covers, when used in conjunction with the fireproofing, shall provide construction which shall maintain the structural steel column lengths within the tolerances specified in Section IV hereof entitled "Criteria".

Nothing contained in the Contract Documents shall be construed to preclude the insulation and the fireproofing from being the same material provided all specified requirements are complied with.

f. Fiber, and other flaking and dusting type fireproofing installed on the tenant side of spandrel beams and column surfaces above finished ceilings shall be complete with an approved sealer that shall prevent cracking, chipping, flaking, dusting, and spalling of the fireproofing material.

g. Fireproofing shall include all adhesives, admixtures, and materials necessary to meet the requirements of the equal system approved by the Underwriters' Laboratories, Inc.

6. Anti-galvanic and moisture barrier materials shall be sealed and bonded permanently to all concealed metallic curtain wall component surfaces to prevent galvanic action and oxidation resulting from moisture being present or absorbed in the insulation and the fireproofing materials. The need for these materials and the types to be used shall be determined by the Contractor as required by the type of curtain wall system to be used and the effectiveness of the methods of sealing and insulating the curtain wall, all as accepted by the Authority.

D. Materials not otherwise specified shall be suitable for their intended purposes and shall provide construction meeting the requirements specified hereinafter for criteria, testing procedures and criteria conformance, finishes, workmanship, fabrication, installation, and guarantees.

E. Colors of exposed sealants, glazing materials, and other materials not otherwise specified shall be as selected and accepted by the Authority to match adjacent construction. Coloring materials shall not adversely affect the properties and characteristics of the materials they color. Colors shall not show any visible changes in shading after weathering.

of Section IV hereof entitled "Criteria". The pressures shall be applied consecutively for the specified pressure time periods starting with the lowest pressure, then progressing in the specified increments to the highest pressure and then regressing in the same increments to the lowest pressure.

b. Water spray nozzles shall be spaced not more than 24 inches on centers.

c. Water infiltration tests will be performed without any fireproofing installed in place.

3. The air infiltration test (NAAMM Test B) shall be performed using the pressure specified in Paragraph D of Section IV hereof entitled "Criteria". This test may be performed with the fireproofing installed in place.

4. The sequence of testing shall be as follows:

a. Water infiltration test at room temperature using the static pressure method, without any fireproofing and insulation installed.

b. Water infiltration test at room temperature using the dynamic pressure method without any fireproofing and insulation installed.

c. Structural performance test at room temperature using the static pressure method without any fireproofing and insulation installed.

d. Water infiltration at 45° F. using the static pressure method without fireproofing and insulation installed.

e. Air infiltration test at room temperature using the static pressure method with fireproofing and insulation installed.

f. Thermal cycling tests with fireproofing and insulation installed, consisting of six cycles with each cycle including 0° F. for one hour and +160° F. for one hour measured at the exterior surface of the spandrel panel. The interior (room-side) conditions shall be controlled at 70° F. ± 3° F. and the relative humidity at 20% ± 5%.

g. Supplementary thermal test in accordance with Paragraph E as hereinafter stated.

VIII. MOCK-UPS

A. Prior to award of Contract, the Authority may exercise its option to perform all the necessary mock-up testing at a testing facility to be selected by the Authority for the purpose of ensuring the criteria conformance specified in Section V hereof entitled "Testing Procedures and Criteria Conformance". The costs of these tests will be borne by the Authority. The costs for furnishing, delivering and erecting the mock-up shall be borne by the Contractor. The mock-up shall be delivered to the testing facility within 8 weeks of receipt of written notification from the Authority.

B. In the event the Authority does not exercise its option, after the award of Contract the Contractor shall perform all mock-up testing at the Contractor's plant for the purpose of ensuring the criteria conformance specified in Section V hereof entitled "Testing Procedures and Criteria Conformance", provided such plant has facilities satisfactory to the Authority. These tests shall be performed under the Authority's supervision, and, except for the cost of the Authority's supervision, the cost for these tests shall be borne by the Contractor.

C. The Contractor shall furnish and construct, for the Authority's approval a full size, three story high, 4 column wide mock-up of the typical facade with 12 foot floor to floor heights (including the full corner condition) to demonstrate the type, finish, and appearance of materials proposed for use, and to demonstrate the methods of workmanship, fabrication, and installation of various components.

1. After award of Contract, this mock-up shall be erected as directed by the Authority at the construction site within 90 days of receipt of written notification from the Authority.

2. This mock-up shall include a complete assembly of column covers, panels, louvers, bases, frames, heads sills, doors, weepholes, splices, hardward, weather-stripping, sealants, gaskets, fastenings, glass and glazing, sprayed-on-fireproofing, insulation, and all other components necessary to show a completely assembled and installed installation of every condition encountered in the curtain wall.